

SYSTEM SUPPORT DIRECTIVE

ASR9

SSM-ASR9-019

6310

**System
Support
Modification**

RECEIVER PROTECTOR REPLACEMENT

Highlights

12/21/2004

1. PURPOSE. This system support modification (SSM) authorizes a replacement to the Airport Surveillance Radar-9 (ASR-9) waveguide hardware. The Receiver Protector (NSN 5960-01-520-3540) will serve as a replacement for the assembly presently used in the ASR-9.

2. DISTRIBUTION.

a. This SSM is distributed to selected offices and services within Washington headquarters, the William J. Hughes Technical Center, the Mike Monroney Aeronautical Center, regional Airway Facilities divisions, and Airway Facilities field offices having the following facilities/equipment: ASR-9.

b. An electronic version and distribution report of this SSM are available on an Intranet site located at <http://aos-ext.amc.faa.gov/> under the "Technical Documentation" heading.

c. To obtain additional hard copies of this publication, contact Printing & Distribution Team, AMI-700B, at (405) 954-6892.

3. WITHDRAWALS. None.

4. REFERENCES.

a. TI 6310.24, ASR-9 System Field Maintenance.

b. Configuration Control Decision (CCD) No. N25627, Receiver Protector Replacement.

5. BACKGROUND. The Federal Aviation Administration's (FAA) ASR-9 uses a very high power transmitter and sensitive receiver. It must isolate the receiver from the transmitter during emission of the high power pulse to avoid damaging the receiver. Additionally, to further protect the receiver, the ASR-9 must disconnect the transmitter during the receiving period so that little of the incoming energy is lost in the transmitter. The Receiver Protectors currently serve these purposes, however, the Receiver Protectors now in use are at the end of their operational lives. Degradation and failure of this assembly has been found to cause subsequent failure in the microwave components due to higher RF energy leaking past the Receiver Protector. Therefore, it has become necessary to replace the existing assembly to provide maximum protection to the receiver. The replacement Receiver Protector has a shelf life of 20 years and a Mean Time Between Failure of 128,000 hours.

DISTRIBUTION: 53AC

INITIATED BY: ASR-9
Terminal/RDAS Branch

6. APPLICATION. This modification applies to all ASR-9 sites that **do not** have the SSM-ASR9-012 Weather Systems Processor (WSP) modification installed. Sites with SSM-ASR9-012 already have the new Receiver Protector (NSN 5960-01-520-3540).

The following list includes those ASR-9 sites that **already** have the new Receiver Protector (NSN 5960-01-520-3540) **installed**, and **do not** have to install this modification:

WSP Locations	State	LOCID	Region
FAA Academy	OK		
FAA Tech Center	NJ		
Albuquerque	NM	ABQ	ASW
Austin-Bergstrom	TX	BSM	ASW
Norfolk/Virginia Beach	VA	ORF	AEA
PSF/AOS250	OK	PSF	
Portland	OR	PDX	ANM
Jacksonville	FL	JAX	ASO
Honolulu	HI	HNL	AWP
Buffalo/Niagara Falls	NY	BUF	AEA
Huntsville/Decatur	AL	HSV	ASO
Grand Rapids	MI	GRR	AGL
San Antonio	TX	SAT	ASW
Syracuse	NY	SYR	AEA
Knoxville	TN	TYS	ASO
Islip/Long Island	NY	ISP	AEA
Sarasota/Bradenton	FL	SRQ	ASO
Seattle	WA	SEA	ANM
El Paso-Biggs	TX	ELP	ASW
Ontario	CA	ONT	AWP
White Plains	NY	HPN	AEA
Madison	WI	MSN	AGL
Los Angeles (South)	CA	LAX	AWP
Birmingham	AL	BHM	ASO
Richmond	VA	RIC	AEA
Greensboro/High Point	NC	GSO	ASO
Harrisburg/Middleton	PA	MDT	AEA
Des Moines	IA	DSM	ACE
Lubbock-Reese	TX	LBB	ASW
Spokane	WA	GEG	ANW
Charleston	SC	CHS	ASO
Tucson	AZ	TUS	AWP
Windsor Locks (Hartford)	CT	BDL	ANE
Albany	NY	ALB	AEA
Rochester	NY	ROC	AEA
Cedar Rapids	IA	CID	ACE
Toledo	OH	TOL	AGL

7. MATERIALS REQUIRED. The following material is required to modify each ASR-9 site:

	<u>Description</u>	<u>NSN</u>	<u>Quantity</u>
a.	Receiver Protector	5960-01-520-3540	4 each
b.	Installation kit	5895-01-499-0511	4 each

8. SOURCE OF MATERIALS. Requisition material through the FAA Logistics and Inventory System. PARTS SHALL BE ORDERED AND USED ONLY FOR MODIFYING THE EQUIPMENT STATED IN PARAGRAPH 6 OF THIS CHAPTER. Do not order extra to ensure a plentiful supply of parts. However, if after receipt, it becomes necessary to obtain certain parts, order the parts separately.

NOTE: SITES THAT HAVE SSM-ASR9-012 WEATHER SYSTEMS PROCESSOR (WSP) MODIFICATIONS INSTALLED SHALL NOT ORDER ANY MATERIALS.

9. SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED. None.

10. PROCEDURE TO BE PERFORMED BY. Field maintenance personnel or as determined by the Regional Airway Facilities division manager.

11. WHEN MODIFICATION IS TO BE PERFORMED. As soon as practical after receipt of this modification.

12. ESTIMATED TIME REQUIRED. This procedure will require 2 technicians for 3 employee hours per channel. Estimated time does not include modification preparation or updating of the instruction books. Total system downtime required is 6 hours.

13. DISPOSITION OF SURPLUS PARTS. Old Receiver Protector contains tritium and promethium 147 gas plasma vials, and may be disposed locally through your hazardous waste manager.

14. PROCEDURE.

NOTE: Review this entire procedure prior to beginning the modification.

a. Assemble the 4 new replacement sections prior to the arranged downtime, using ¼ x 28x3/4" bolts, flat washers, lock washers and rubber gasket from installation kit. Assemble the new Receiver Protector output end to the 5" straight waveguide as shown on Page 5 of Appendix 2. Follow the waveguide flange bolt torquing sequence requirements outlined in TI 6310.24, paragraph 7.4.1.2 and/or Page 4 of Appendix 2.

NOTE: There is no hole on Receiver Protector top center position at Output end. Apply Non-Acetone based Silicone Compound to rubber gasket before assemble.

b. Pre-Installation Checks

(1) Before the scheduled installation of the modification equipment, the following checks are required to ensure that pressure windows are in good condition in both channels. If blown pressure window is detected, use site spare or order window P/N 645A895H02 before continuing with step c.

(2) The strategy proposed in this section provides a method to check the pressure window without requesting downtime. This method uses the Waveguide Pressurization Manifold valves to bleed the Standby Channel's waveguide pressure down, while the Online channel is operating. This shall isolate the sections of waveguide in the Standby channel, but the Rotary Joint will remain completely pressurized. This method also follows the procedures for waveguide removal and installation in TI 6310.24 paragraph 7.4.1.1 to isolate and depressurize a specific section of the waveguide.

WARNING

Stop the procedure immediately if air leak is detected. This will cause the ONLINE channel to fail.

Turn OFF High Voltage on channel under test.

(3) Refer to TI 6310.24 Fig. 11-16, sheet 2 of 2. First turn OFF the pressure by closing only the Standby Transmitter channel and High Beam Waveguide valves located on the waveguide pressurization distribution manifold. Then bleed the air from those sections using the valve core in the adjacent pressure/bleed valve while observing the manifold pressure gauge for any sign of a drop in pressure.

(4) If a drop in manifold pressure is detected, stop the procedure because the air is leaking through a pressure window and this will cause the Online channel to fail.

(5) The pre-installation check is complete when both sections of waveguide are pressurized, and the manifold pressure is nominal.

c. System Baseline Check. At the local site, check the status of each channel prior to performing the modification.

(1) At the local RMS terminal, access the CHANNEL A/B RECEIVER RECOVERY TEST RESULTS menu (0.3.3.1) for the channel under modification, record the high beam, and low beam recovery level. The measured channel must be online and stabilized for 15 minutes prior to recording the data.

	Channel A	Channel B
HI-BEAM RECEIVER RECOVERY LEVEL		
Mean	_____dB	_____dB
Standard Deviation	_____dB	_____dB
LO-BEAM RECEIVER RECOVERY LEVEL		
Mean	_____dB	_____dB
Standard Deviation	_____dB	_____dB

(2) At the local RMS terminal, access the PROGRAMMABLE ALARM THRESHOLD ALARMS menu (0.2.15.2), record the high beam, and low beam channel Minimum Discernible Signal (MDS) measurement and noise figure. The measured channel must be online and stabilized for 15 minutes prior to recording the data.

	Channel A	Channel B
MDS HI-BEAM	_____ dBm	_____ dBm
MDS LO-BEAM	_____ dBm	_____ dBm

	Channel A	Channel B
NF HI-BEAM	_____dB	_____dB
NF LO-BEAM	_____dB	_____dB

(3) At the local RMS terminal, access the ALARM REPORTS menu (0.2). Observe the ALARM REPORTS menu and verify that no summary alarms (SA) exist.

(4) At the local RMS terminal, perform FAULT ISOLATION TEST (FIT) on Radar Equipment menu (0.4.1) and select command 2 A/B. Verify FIT result indicate that the channel A/B DSP/SYNC/RCVR is operational.

d. Target Channel Receiver Protector replacement. The following is the recommended procedure for replacement of the existing Receiver Protector:

(1) On the channel being modified, temporarily support the Sensitivity Time Control STC A6 (A5) and the high beam STC unit A4 (A3) securely to the overhead Unistrut™, using long tywraps or strap. Extreme caution should be taken so no waveguide is left unsupported at any time.

WARNING

The transmitter of the channel being modified must be OFF during the installation of the new Receiver Protectors.

(2) To prevent inadvertent transmitter high voltage turn on, access RMS SYSTEM CONTROL PANEL menu (0.1.1) and set HIGH VOLTAGE OFF for the appropriate transmitter.

Refer to TI 6310.25 paragraph 3.2.1 to place standby transmitter in maintenance mode.

Turn off HIGH VOLTAGE POWER circuit breaker CB1, AUXILIARY POWER circuit breaker CB2 and engage circuit breaker lock on power distribution panel.

Turn off Channel A/B Transmitter circuit breaker in Panel Board A15.

(3) Depressurize the waveguide system on the channel being modified by following the waveguide removal and installation procedures in TI 6310.24, paragraph 7.4.1.1.

(4) Remove the section of waveguide between the Isolator HY4 (HY5) and the low beam STC unit A6 (A5). This section includes the following components: Receiver Protector A8 (A7), and a 14" straight WR-284 waveguide section. Make certain to save the bolts, washers, nuts and waveguide gasket for reuse.

(5) Using bolts, flat washers, lock washers and gasket attach the pre-assembled Receiver Protector section to the ASR9 waveguide structure as shown in Page 6 of Appendix 2. Follow the waveguide flange bolt torquing sequence requirements outlined in TI 6310.24, paragraph 7.4.1.2 and/or page 4 of Appendix 2.

(6) Remove the section of waveguide between the Flexguide and the high beam STC unit A4 (A3). This section includes the following components: waveguide gasket, high beam

directional coupler DC2 (DC1), Pressure Window, Receiver Protector A2 (A1), and a 14" straight WR-284 waveguide section. Make certain to save the Directional Coupler DC2 (DC1), bolts, washers, nuts, gasket and Pressure Window for reuse.

(7) Assemble RF IN end of high beam directional coupler DC2 (DC1) to gasket then the INPUT end of pre-assembled Receiver Protector section. Using bolts, flat washers, lock washers attach the rubber gasket, the above section, Pressure Window to the ASR9 waveguide structure as shown in page 6 of Appendix 2. Follow the waveguide flange bolt torquing sequence requirements outlined in TI 6310.24, paragraph 7.4.1.2 and/or page 4 of Appendix 2.

NOTE: Orientate the RF IN of high beam directional coupler DC2 (DC1) to INPUT of Receiver Protector. The new location of the pressure window is between flexguide and directional coupler. The new location of the gasket is between Receiver Protector and directional coupler.

(8) Verify the waveguide is properly supported by the Unistrut™ channel, and then remove the temporary support.

(9) On the channel being modified purge and pressurize the waveguide system in accordance with procedures in TI 6310.24, paragraph 7.4.1.3.

(10) Turn on Channel A/B Transmitter circuit breaker in Panel Board A15. Turn ON HIGH VOLTAGE POWER circuit breaker CB1, AUXILIARY POWER circuit breaker CB2.

15. TEST AFTER MODIFICATION.

a. Perform Fault Isolation Test (FIT) on the modified channel. Refer to this SSM, section 14.c.(4).

b. Check MDS, noise figure and receiver recovery level according to TI 6310.24, Table 7-1 and compare to the recorded data in this SSM, section 14.c.1 and 2.

16. RESULT OF MODIFICATION. This modification will reduce the possibility of the ASR-9 system disruption and/or failure due to Receiver Protector degradation.

17. CHANGES TO INSTRUCTION BOOKS.

SSD PAGE CONTROL CHART			
Remove Pages	Dated	Insert Pages	Dated
<u>SSD TOC</u>			
All pages	All dates	All pages	12/21/2004
TI 6310.24			
xxv and xxvi	undated	xxv	12/21/2004
		xxvi	undated
8-35 and 8-36	undated	8-35	12/21/2004
		8-36	undated
11-59/11-60	undated	11-59/11-60	12/21/2004
11-85/11-86	undated	11-85/11-86	12/21/2004
11-89/11-90	undated	11-89/11-90	12/21/2004

SSD PAGE CONTROL CHART (Continued)

Remove Pages	Dated	Insert Pages	Dated
11-91/11-92	undated	11-91/11-92	12/21/2004
B-19 and B-20	undated	B-19	12/21/2004
		B-20	undated
TI 6310.25			
6-5 and 6-6	undated	6-5	undated
		6-6	12/21/2004

18. CHANGES TO INSTALLATION DRAWINGS. Installation Drawings referenced in this procedure are included in Appendix 2 of this document.

19. CHANGES TO RECORDED DATA. Process a modification record and place this record into the Facility Reference Data File (FRDF) in accordance with the latest Order 6032.1 National Airspace System Modification Program and Order 6030.45 Facility Reference Data File.

20. ADDRESS CHANGES. Submit facility address, copy count, and additions or deletions to Carrie Batty via email to Carrie.ctr.Batty@faa.gov.

21. CLARIFICATION OR COMMENTS. This chapter will be included in the next revision to the table of contents.

22. RISKS. If changes are not incorporated, unauthorized configuration may degrade the efficiency of the National Airspace Systems (NAS) and the ability to maintain operations.

23. FALLBACK PROCEDURES. If changes are not incorporated or unattainable by the installer, contact AOS-200 for field support assistance to clarify procedures and options.

24. STATUS ACCOUNTING. Providing your equipment is listed in the Facility/Service Equipment Profile (FSEP), the Maintenance Organization has opened a Log Equipment Modification (LEM) record in the Maintenance Management System (MMS).

- a. Upon completion of this modification, you are required to close the LEM record and change the Maintenance Action Code (MAC) to:
 - (1) **"G"** if the modification was completed.
 - (2) **"W"** if the modification is not applicable.
- b. Verify that an **"N"** is in the **"REP COD"** field to ensure that the log entry will be upwardly reportable to the national database for National MOD Tracking.
- c. The data entry record is to be entered into the LEM as follows:

MMS FIELD NAME DATA ENTRY

FAC/SERV: ASR9

LOC IDENT: XXXX

NOTE: Enter your site identification code associated with the FSEP facility identification code for ASR9 (53AC).

SHORT NAME: SYS

ORDER#/SYSTEM: SSM-ASR9

CHAP/SEQ#: 019

CHG: HW

NOTE: If you have questions about the LEM entries made by the maintenance engineering organization, please call Trudy Green (405) 954-4421.

25. RECOMMENDATIONS FOR CHANGES. Forward any recommendations for changes to this directive through normal channels to the National Airway Systems Engineering Office.



for Richard A. Thoma
Director for Technical Operations Support

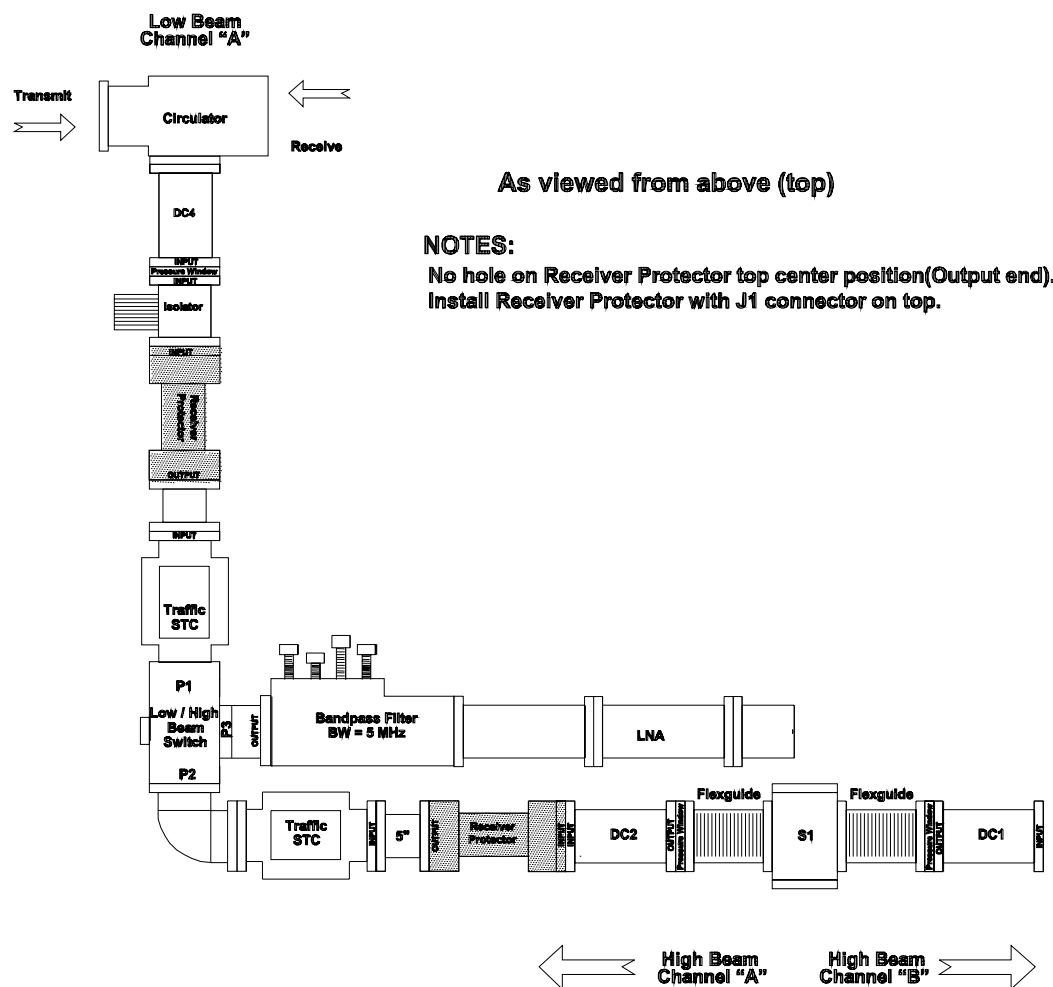
LIST OF APPENDIXES AND ATTACHMENTS

ITEM	DESCRIPTION	QUANTITY
APPENDIX 1	APPENDIX 1 TEST AND EVALUATION GOLD STANDARD CONSIDERATIONS	1
APPENDIX 2	INSTALLATION DRAWINGS	1
ATTACHMENT 1	SSD TABLE OF CONTENTS	1
ATTACHMENT 2	INSTRUCTION BOOK CHANGES	1

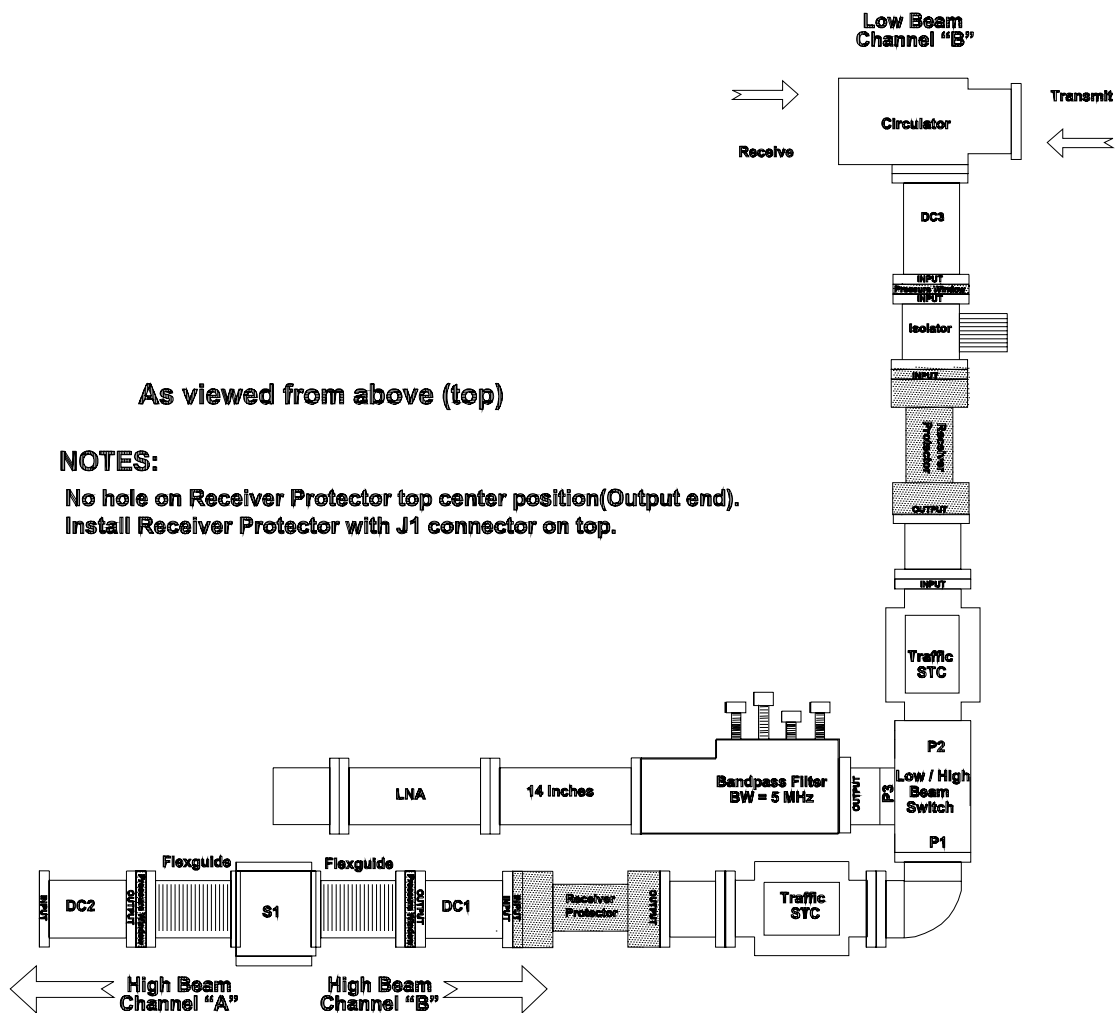
APPENDIX 1. TEST AND EVALUATION GOLD STANDARD CONSIDERATIONS

1. **Purpose** - This appendix communicates the type of Gold Standard testing that was accomplished on this directive, SSM-ASR9-019. The scope of the testing conducted on this modification and test results are provided. Any additional unique testing or evaluation beyond the normal modification tests, that needs to be conducted during the field installation, is included in the Test Limitation paragraph.
2. **Scope** - This modification has completed development and systems testing. The system test was conducted at the facility with the system modification baseline at software and hardware modifications through SSM-ASR9-005. Key site testing of this modification was conducted at two other facilities with the same baseline as the system test.
3. **Results** - The system test was conducted at the White Plains, NY facility during periods of both peak and normal target load over a period of 24 months. The system test was successful and completed on March 19, 2001.
4. **Test Limitations** - This modification was tested and validated in all known configurations and no additional unique testing is required.

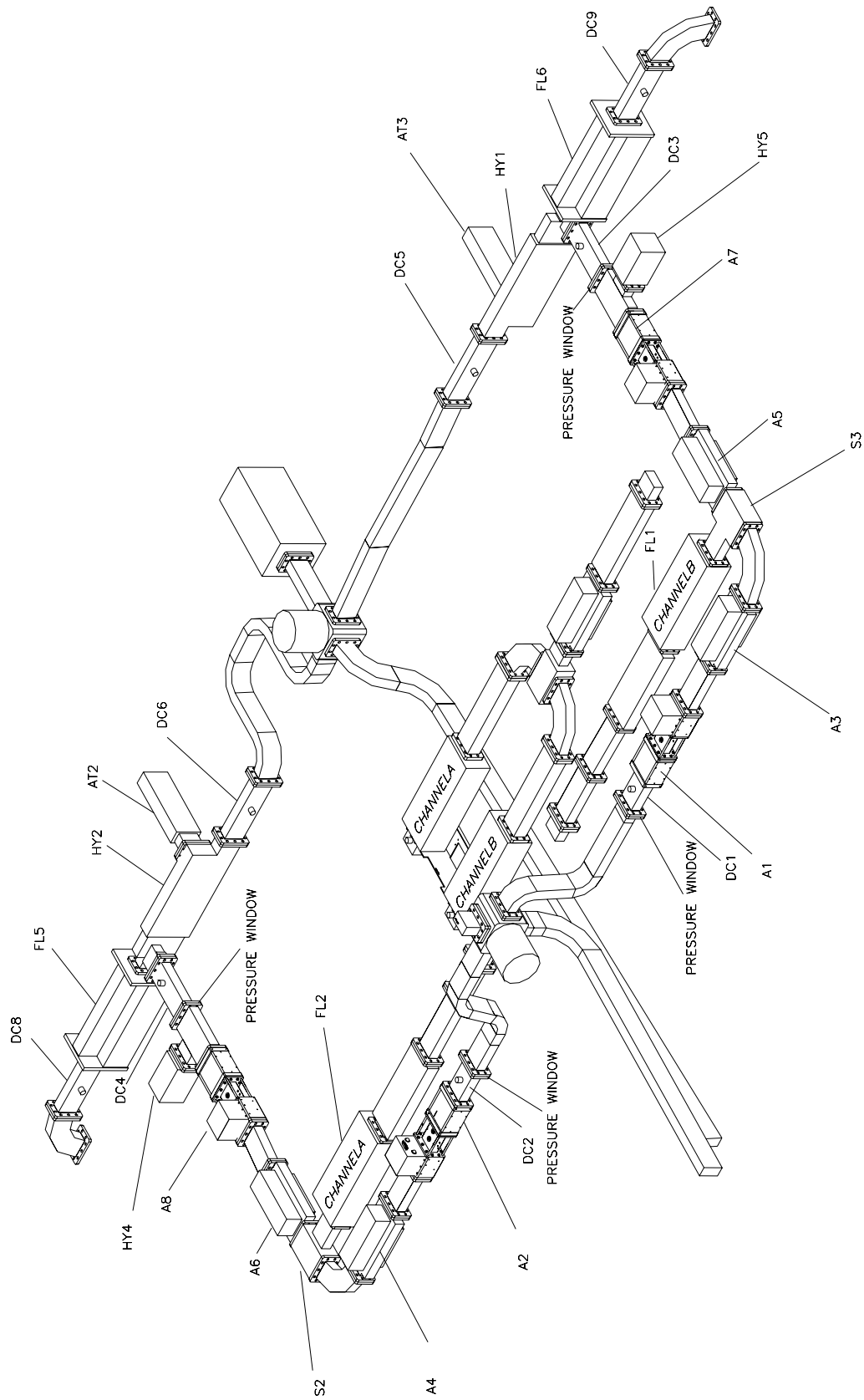
APPENDIX 2. INSTALLATION DRAWINGS



ASR-9 TARGET CHANNEL A WAVEGUIDE

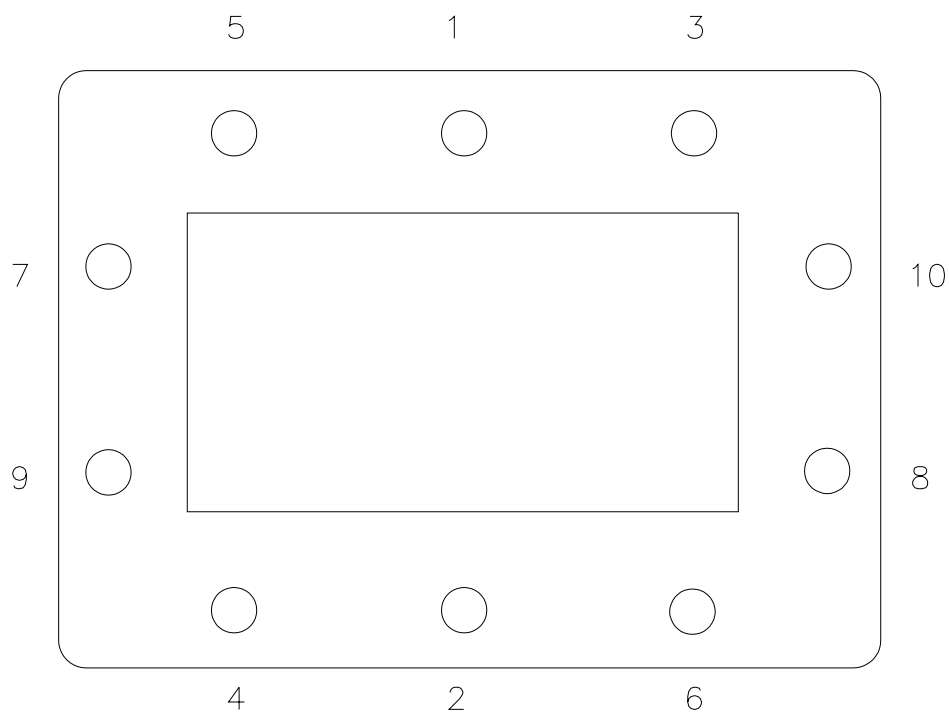


ASR-9 TARGET CHANNEL B WAVEGUIDE

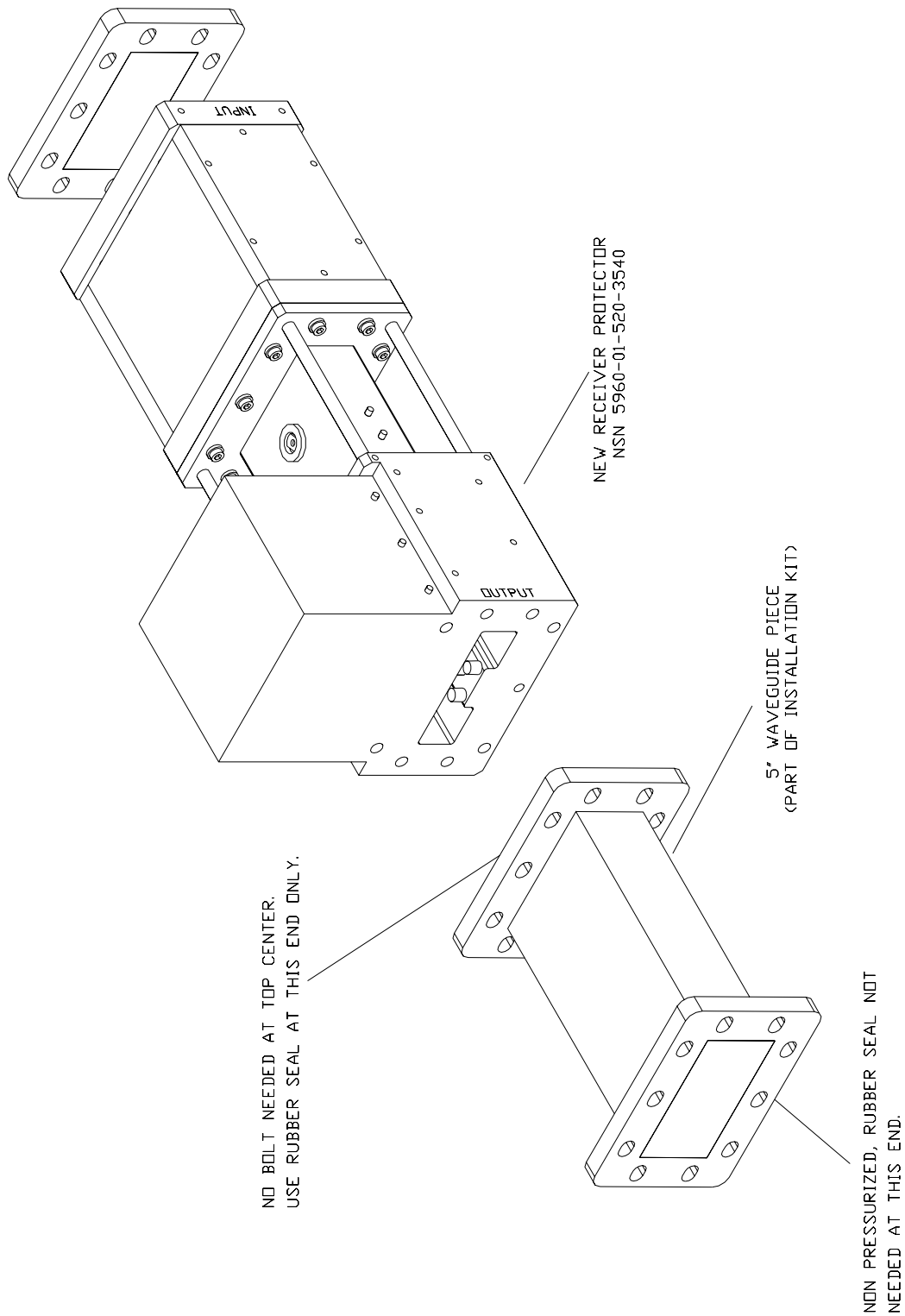


PARTS REFERENCE

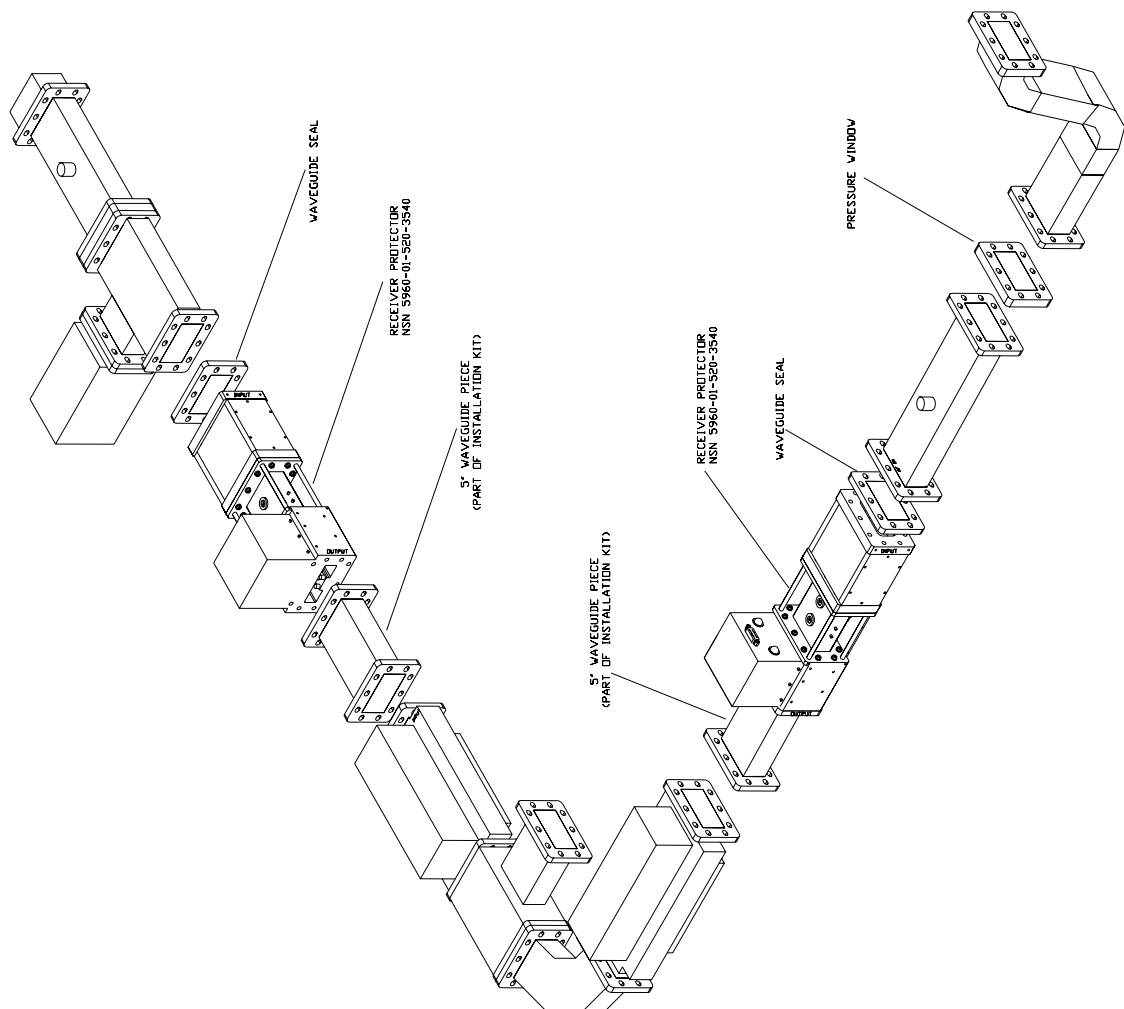
WAVEGUIDE FLANGE BOLTS TO BE TORQUED
IN 4 STAGES IN THE SEQUENCE SHOWN:
25 INCH-LBS.
50 INCH-LBS.
70 INCH-LBS.
AFTER 20 MIN. RETORQUE TO 70 ± 10 INCH-LBS



WAVEGUIDE FLANGE TORQUING SEQUENCE



ASSEMBLY DETAIL (SHEET 1)



ASSEMBLY DETAIL (SHEET 2)

ATTACHMENT 1. SSD TABLE OF CONTENTS

SYSTEM SUPPORT DIRECTIVE (SSD)

TABLE OF CONTENTS

SYSTEM SUPPORT MODIFICATIONS (SSM)

<u>Document Number</u>	<u>Date Issued</u>	<u>Title</u>
SSM-ASR9-001	04/23/99	ASRS-9 SERIAL INTERFACE SYSTEM
SSM-ASR9-002	02/06/98	TRANSMITTER POWER INTERRUPT AND BLOWER MOTOR FUSE
SSM-ASR9-003	10/19/99	REMOVAL OF CIRCUIT BREAKERS FROM MODEM RACK
SSM-ASR9-004	03/13/98	UPGRADE MODE-S INTERFACE SUPPORT
SSM-ASR9-005	04/01/99	PROCESSOR AUGMENTATION CARD PHASE I
SSM-ASR9-006	04/29/98	ASR-9 REMOTE SCIP CIRCUIT BREAKER WIRING CONNECTION
SSM-ASR9-007	06/07/99	ALTERNATE DUAL REDUNDANT MODIFICATION
SSM-ASR9-008	08/02/99	MUFFIN FAN REPLACEMENT
SSM-ASR9-009	TBD	PROCESSOR AUGMENTATION CARD PHASE II
SSM-ASR9-010	CANCELLED	ASR-9 UPDATES
SSM-ASR9-011	03/26/03	SOFTWARE SUPPORT FOR THE WEATHER SYSTEMS PROCESSOR
SSM-ASR9-012	06/19/03	WEATHER SYSTEMS PROCESSOR INTERFACE TO THE ASR-9
SSM-ASR9-013	06/05/01	ASR-9 SERIAL INTERFACE SYSTEM (ASIS) PHASE II
SSM-ASR9-014	05/20/04	ANOMALOUS PROPAGATION (AP) FILTER
SSM-ASR9-015	TBD	UPDATE PROCOMM PLUS SCRIPTS
SSM-ASR9-016	07/14/03	ASR-9 SERIAL INTERFACE SYSTEM (ASIS) PHASE II DUAL BOARD

SYSTEM SUPPORT MODIFICATIONS (SSM) (Continued)

<u>Document Number</u>	<u>Date Issued</u>	<u>Title</u>
SSM-ASR9-017	TBD	ASR-9 SERIAL INTERFACE SYSTEM (ASIS) PHASE II -- SMART MODE SOFTWARE
SSM-ASR9-018	11/22/04	SAFETY ANCHOR BRACKET
SSM-ASR9-019	12/21/04	RECEIVER PROTECTOR REPLACEMENT

SYSTEM TECHNICAL RELEASES (STR)

<u>Document Number</u>	<u>Date Issued</u>	<u>Title</u>
STR-ASR9-001	02/06/98	DELIVERY OF AIRPORT SURVEILLANCE RADAR-9 PROCOMM SOFTWARE UPDATE
STR-ASR9-002	12/29/98	DELIVERY OF AIRPORT SURVEILLANCE RADAR-9 PROCOMM SOFTWARE UPDATE VERSION 5.0
STR-ASR9-003	11/29/99	DELIVERY OF AIRPORT SURVEILLANCE RADAR-9 SOFTWARE UPDATE VERSION 6.0
STR-ASR-9-004	12/15/99	ASR-9 VARIABLE SITE PARAMETERS AND PROGRAMMABLE ALARM THRESHOLD/FILTER BASELINE
STR-ASR9-004A	06/20/01	ASR-9 VARIABLE SITE PARAMETERS AND PROGRAMMABLE ALARM THRESHOLD BASELINE UPDATES

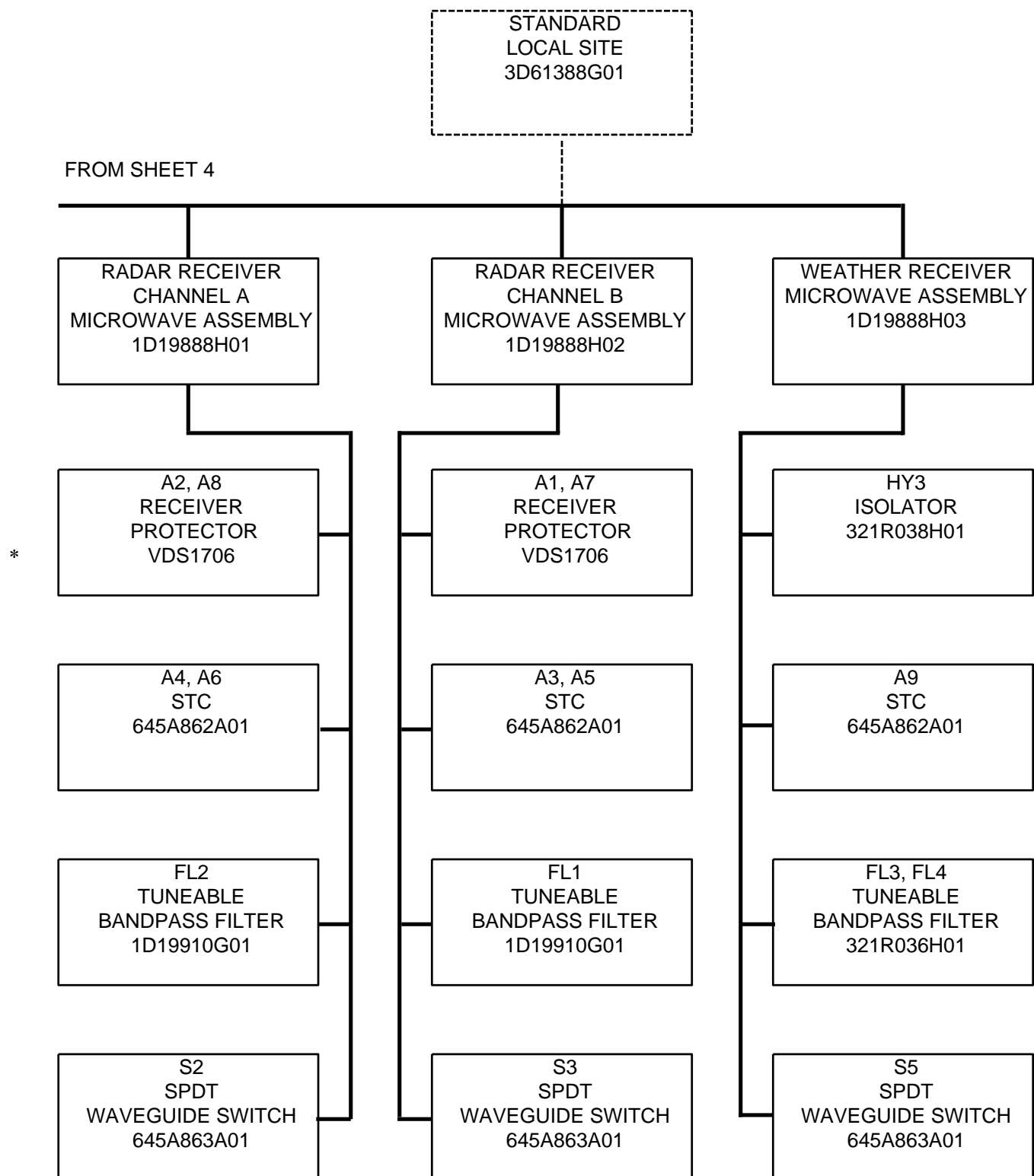
SYSTEM DOCUMENTATION RELEASES (SDR)

<u>Document Number</u>	<u>Date Issued</u>	<u>Title</u>
SDR-ASR9-001	CANCELLED	BY SDR-ASR9-002
SDR-ASR9-002	CANCELLED	BY SDR-ASR9-003

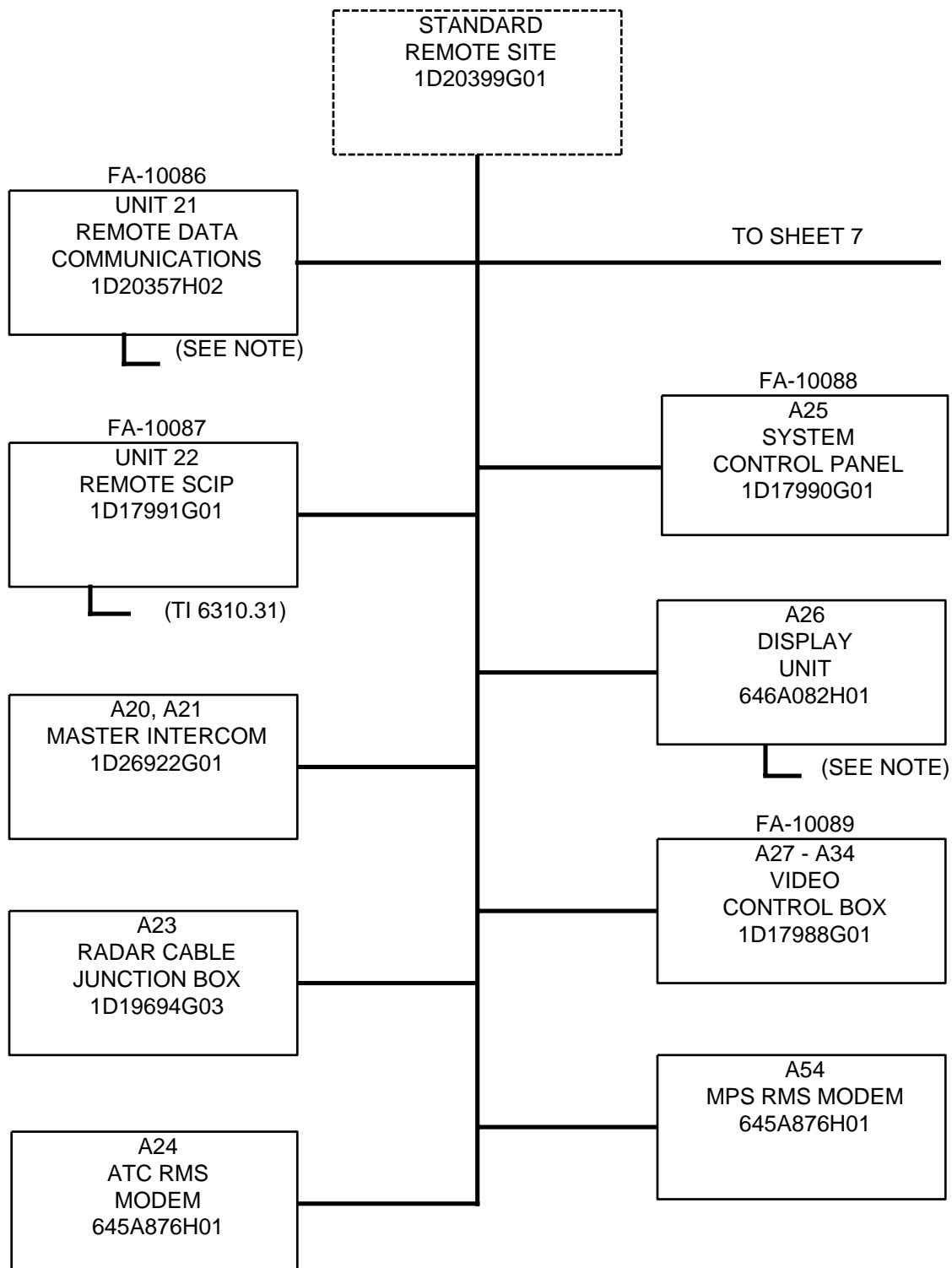
SYSTEM DOCUMENTATION RELEASES (SDR) (Continued)

<u>Document Number</u>	<u>Date Issued</u>	<u>Title</u>
SDR-ASR9-003	05/09/02	ASR-9 TECHNICAL INSTRUCTION BOOKS UPDATE AND REISSUE OF ASR- 9 TI CD ROM
SDR-ASR9-004	09/02/03	DELIVERY OF THE AIRPORT SURVEILLANCE RADAR-9 OPTIMIZATION PROCEDURES
SDR-ASR9-005	07/12/04	UPDATE TO STR-ASR9-004A
SDR-ASR9-006	01/23/04	UPDATE TO SSM-ASR9-012 OMIT INCORPORATION OF TI 6310.28 PAGE CHANGES
SDR-ASR9-007	TBD	UPDATE TO TI 6310.28
SDR-ASR9-008	CANCELLED	UPDATE TO EEM 6310.18, CHG. 19, CHAP. 16
SDR-ASR9-009	11/02/04	UPDATE TO TI 6310.25
SDR-ASR9-010	10/08/04	UPDATE TO SSM-ASR9-014
SDR-ASR9-011	10/06/04	ANTENNA WRENCHES

ATTACHMENT 2. INSTRUCTION BOOK CHANGES



FAMILY TREE (SHEET 5)



NOTE: SEE COMMERCIAL MANUAL

FAMILY TREE (SHEET 6)

PARTS LIST					
REF DES	I N	NAME OF PART/DESCRIPTION	MFR CODE NO.	JAN/MIL MFR. PART. NO	NOTES
N1N1N1N6N1 W161	F	CABLE ASSEMBLY, RIBBON	97942	157C028G31	
N1N1N1N6N1W161 ZZ1	G	CABLE ASSEMBLY, FLEXIBLE, DIM 120	97942	645A681H03	
N1N1N1N6N1 W162	F	CABLE ASSEMBLY, RIBBON	97942	157C028G32	
N1N1N1N6N1W162 ZZ1	G	CABLE ASSEMBLY, FLEXIBLE, DIM 120	97942	645A681H03	
N1N1N1N6N1 W163	F	CABLE ASSEMBLY, RIBBON	97942	157C028G33	
N1N1N1N6N1W163 ZZ1	G	CABLE ASSEMBLY, FLEXIBLE, DIM 80	97942	645A681H02	
N1N1N1 N7	D	MICROWAVE ASSEMBLY, RADAR RECEIVER, CHANNEL A	97942	1D19888G01	
N1N1N1N7 A2	E	RECEIVER PROTECTOR, MICROWAVE, 2.7 - 2.9 GHZ FREQ. RANGE	88236	VDS1706	
N1N1N1N7 A4	E	SENSITIVITY TIMING CONTROL ASSEMBLY (STC) 2.7 - 2.9 GHZ FREQ. RANGE	97942	645A862A01	
A6	E	SAME AS N1N1N1N7A4			
A8	E	SAME AS N1N1N1N7A2			
FL2	E	FILTER, BANDPASS, TUNEABLE, 2.7 - 2.9 GHZ, -3DB ATTENUATION OVER 10 MHZ, 1MW PK SIGNAL INPUT PWR	97942	321R036H01	
S2	E	SWITCH ASSEMBLY, (SPDT), 2.7 TO 2.9 GHZ - PIN DIODE	97942	645A863A01	
N1N1N1 N8	D	MICROWAVE ASSEMBLY, RADAR RECEIVER, CHANNEL 8	97942	1D19888G02	
N1N1N1N8 A1	E	RECEIVER PROTECTOR, MICROWAVE, 2.7 - 2.9 GHZ FREQ. RANGE	88236	VDS1706	
A3	E	SENSITIVITY TIMING CONTROL ASSEMBLY (STC) 2.7 - 2.9 GHZ FREQ. RANGE	97942	645A862A01	

PARTS LIST					
REF DES	I N	NAME OF PART/DESCRIPTION	MFR CODE NO.	JAN/MIL MFR. PART. NO	NOTES
A5	E	SAME AS N1N1N1N8A3			
A7	E	SAME AS N1N1N1N8A1			
FL1	E	FILTER, BANDPASS, TUNEABLE, 2.7 - 2.9 GHZ, -3D8	97942	321R036H01	
S3	E	ATTENUATION OVER 10 MHZ, 1 MW PK SIGNAL INPUT PWR SWITCH ASSEMBLY, (SPDT), 2.7 TO 2.9 GHZ - PIN DIODE	97942	645A863A01	
N1N1N1 N9	D	MICROWAVE ASSEMBLY, WEATHER RECEIVER	97942	1D19888G03	
N1N1N1N9 A9	E	SENSITIVITY TIMING CONTROL ASSEMBLY (STC) 2.7 - 2.9 GHZ FREQ. RANGE	97942	645A862A01	
CP3	E	ADAPTER, 2.6 GHZ TO 3.95 GHZ FREE RANGE, 1.25:1 VSWR, 200 W PEAK POWER, 0.2 DB MAX INSERTION LOSS	97942	645A657H01	
CP4	E	SAME AS N1N1N1N9CP3			
FL3	E	FILTER, BANDPASS, TUNEABLE, 2.7 - 2.9 GHZ, -3DB ATTENUATION OVER 10 MHZ, 1 MW PK SIGNAL INPUT PWR	97942	321R036H01	
N1N1N1N9 FL4	E	SAME AS N1N1N1N9FL3			
HY3	E	ISOLATOR, 2.7 - 2.9 GHZ, 18 DB, 1.2:1 VSWR, 0.3 WATT AVG PWR	97942	321R038H01	
S5	E	SWITCH ASSEMBLY, (SPDT), 2.7 - 2.9 GHZ - PIN DIODE	97942	645A863A01	
N1N1N1 N10	D	DUAL REDUNDANT CABLE LIST	97942	3D54997GO1	
N1N1N1N10 W69	E	CABLE ASSEMBLY	97942	158C060G06	
W70	E	CABLE ASSEMBLY	97942	158C06OG07	
W71	E	CABLE ASSEMBLY, RIBBON	97942	157C028G84	
N1N1N1 N11	D	SPECIAL HANDLING EQUIPMENT	18323	3454B41G02	
N1N1N1N11 N1	E	BEARING SLING	97942	W404ACSP018	
N2	E	ROTARY JOINT, TRANSFER FIXTURE	18323	2D08939G01	
N3	E	DRIP PAN	06307	KPI5-4170	
N4	E	KLYSTRON, F COIL AND S PLATE SLING	97942	WSP4415	
N5	E	KLYSTRON, STORAGE CONTAINER	18323	2D08935G01	

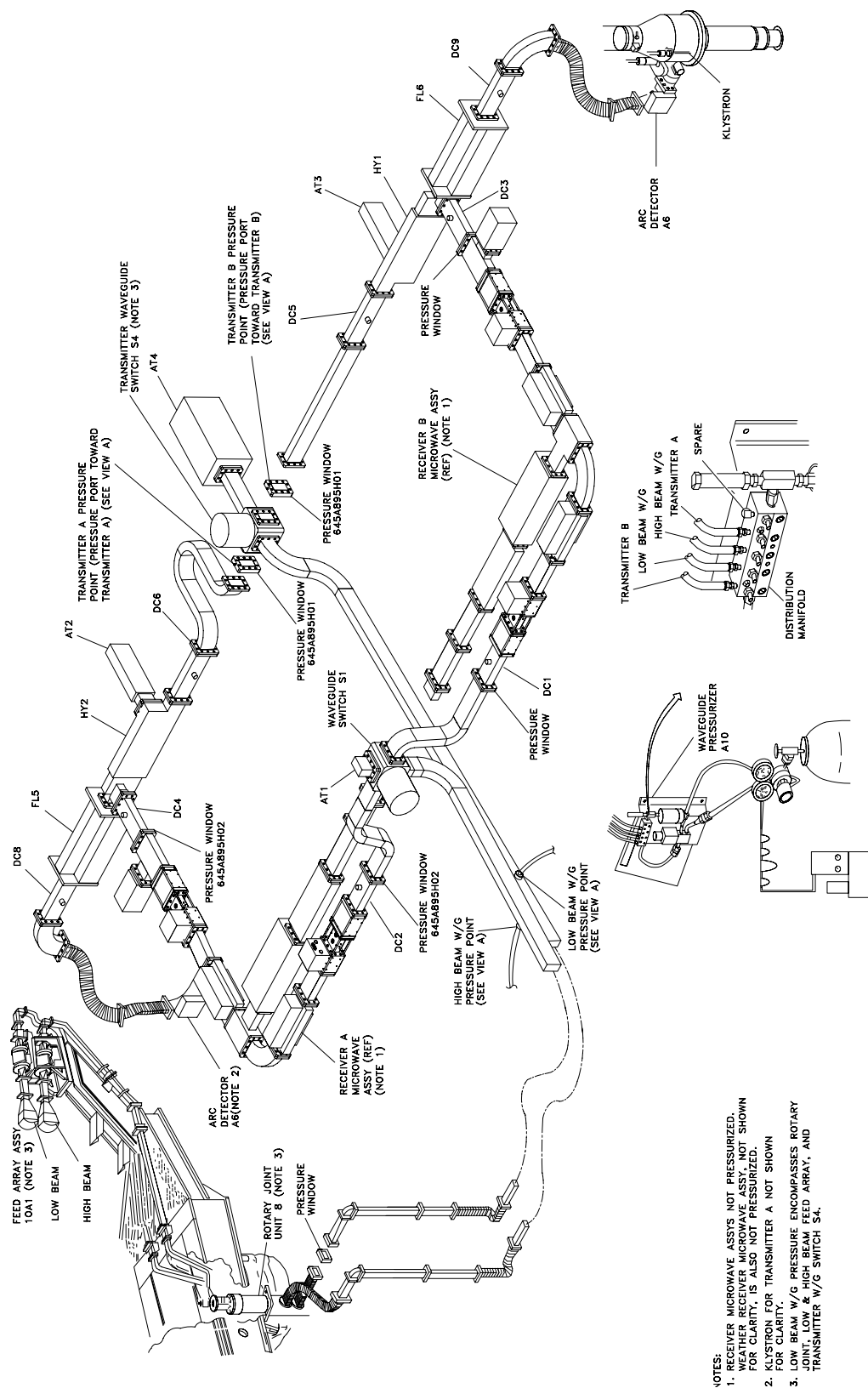


FIGURE 11-16. WAVEGUIDE PRESSURIZATION SYSTEM (SHEET 2-END)

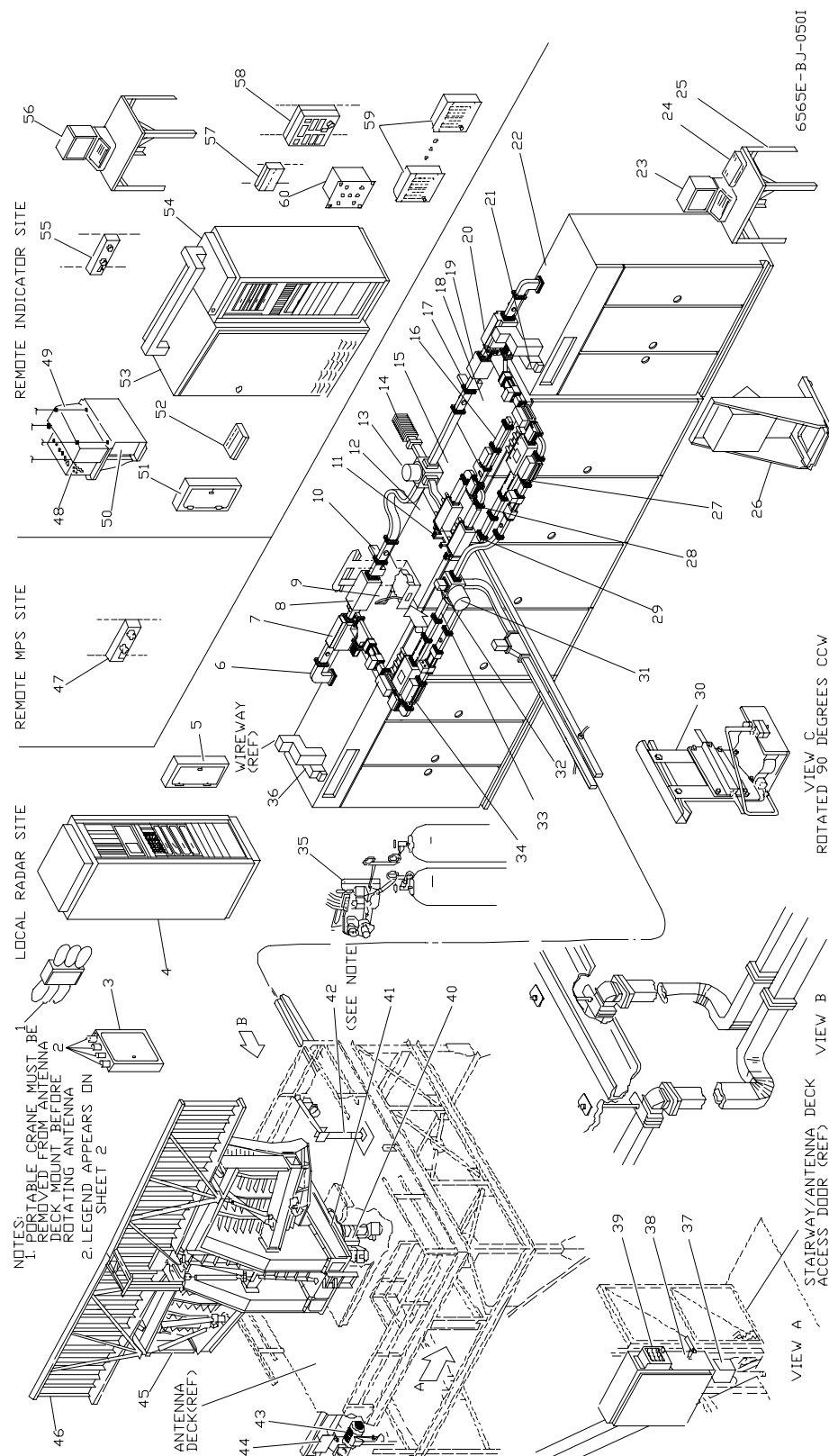


FIGURE 11-26. ASR-9 SYSTEM PARTS LOCATION DIAGRAM (SHEET 1)

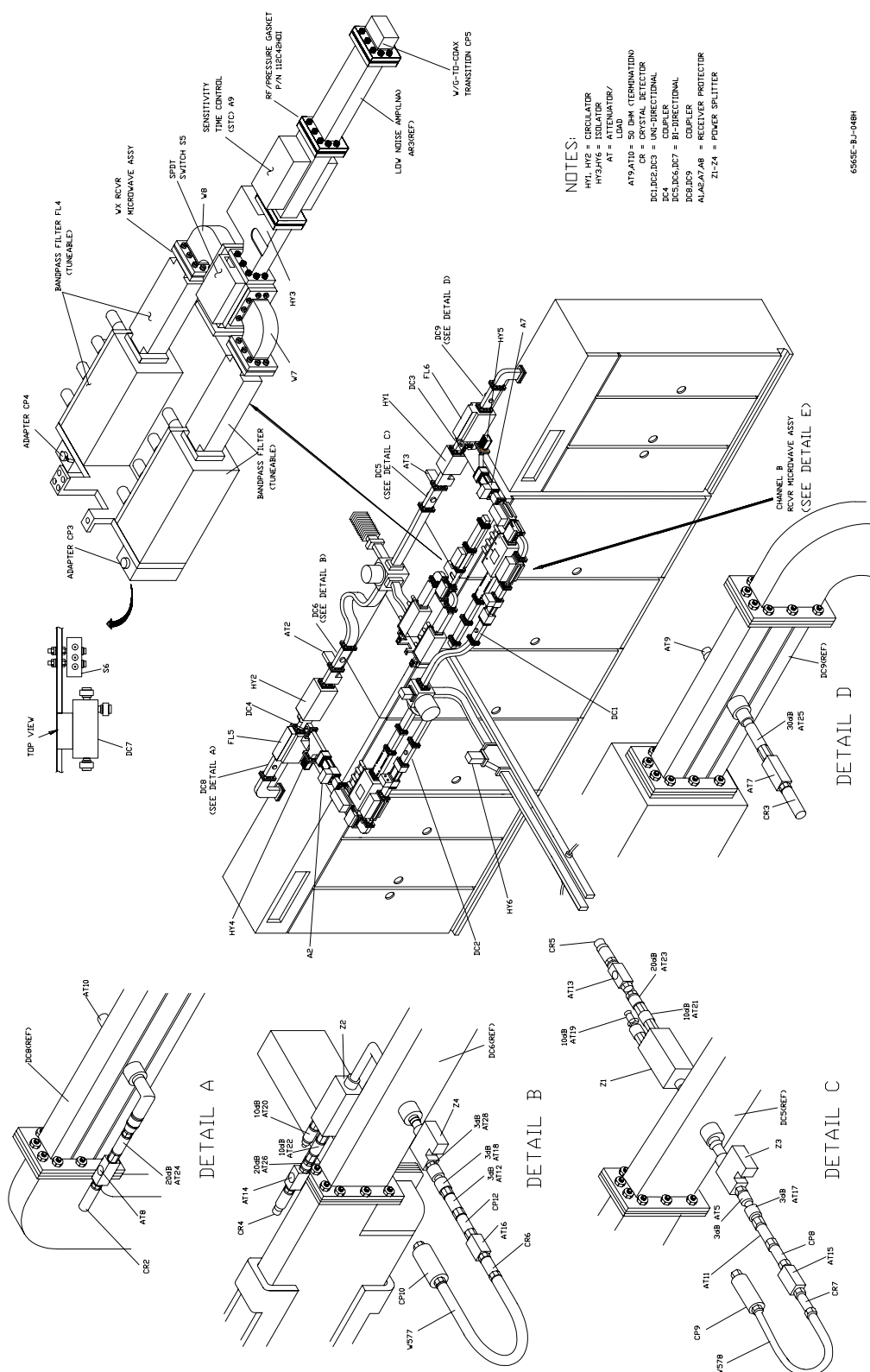


FIGURE 11-26. ASR-9 SYSTEM PARTS LOCATION DIAGRAM (SHEET 3)

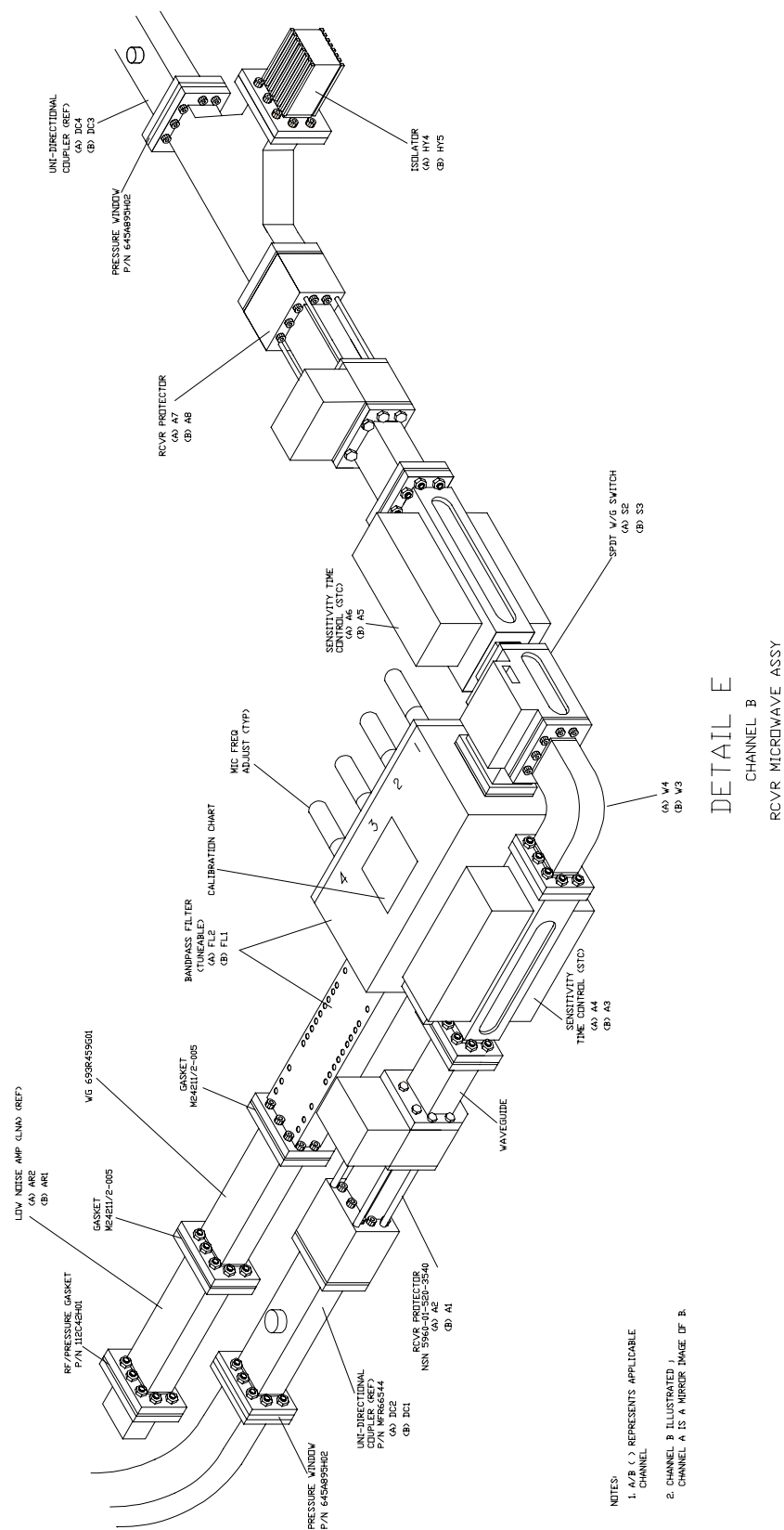


FIGURE 11-26. ASR-9 SYSTEM PARTS LOCATION DIAGRAM (SHEET 4)

WESTINGHOUSE ELECTRIC CORP.				CAGE CODE: 97942		PL1D18000	REV: CL	SHEET: 18
G01 QTY REQD	U OF M	CAGE CODE	PART OR IDENTIFYING NO.	SYM	NOMENCLATURE OR DESCRIPTION	GOVERNMENT IDENTIFICATION	WESTINGHOUSE IDENTIFICATION	FIND NO.
REF			645A836H23	V	PLATE, FLAT SEE NOTE 8 (QTY = 17)			195(CF)
2			M39030/3-02S		TERMINATION AT9-10	MIL-T-39030		196(BL)
			580R142H05	ALT				
* REF			VDS1706	V	RECEIVER PROTECTOR A1, A2			197(AP) *
REF			321R036H01		BANDPASS FILTER FL1, FL2			198(CG)
REF			1D22329H01	V	CIRCULATOR LOAD SEE NOTE 20 AT2-3			199(AP)
1			646A043A01	V	BOX, CIRCUIT BREAKER SEE NOTE 28 A15			200(CH)
4			1A20734H01	V	SURGE SUPPRESSOR			201(AR)
REF			342C971H12	V	CONDUIT 120.00 PORM 1.50 LG SEE NOTE 9 (QTY = 11)			202(CF)
REF			342C971H08	V	CONDUIT 120.00 PORM 1.50 LG SEE NOTE 9 (QTY = 5)			203(CF)
REF	83664		1342-34264		CONDUIT 900.00 PORM 20.00 LG SEE NOTE 9 (QTY = 1)			204(CF)
REF	15235	LR67			FITTING, LR, 2 IN SEE NOTE 9 (QTY = 18)			205(CF)

WESTINGHOUSE ELECTRIC CORP.				CAGE CODE: 97942		PL1D18000	REV: CL	SHEET: 19
G01 QTY REQD	U OF M	CAGE CODE	PART OR IDENTIFYING NO.	SYM	NOMENCLATURE OR DESCRIPTION	GOVERNMENT IDENTIFICATION	WESTINGHOUSE IDENTIFICATION	FIND NO.
REF		15235	T67		FITTING, TEE, 2 IN SEE NOTE 9 (QTY = 6)			206(CF)
REF			1A20330H01	V	CONNECTOR, 2 IN FLEX SEE NOTE 9 (QTY = 8)			207(CF)
REF		15235	MW455		CONNECTOR, 2 IN EMT SEE NOTE 9 (QTY = 60)			208(CF)
* FIND NO. 209 DELETED AT REV AT *								
REF			142C913H05	V	LOCKNUT, CONDUIT, 2.000 SEE NOTE 9 (QTY = 27)			210(CF)
REF			645A865H08	V	WIREWAY, ELECTRICAL			211(BG)
REF			645A865H07	V	WIREWAY, ELECTRICAL			212(BG)
REF			MS25281-R16		CLAMP, LOOP			213(AP)
REF			54B7288H04	V	WASHER, D SEE NOTE 12 (QTY = 2)			214(CF)
REF			645A865H12	V	WIREWAY, ELECTRICAL			215(BG)
REF			645A865H09	V	WIREWAY, ELECTRICAL			216(BG)
REF			645A865H01	V	WIREWAY, STRT SEE NOTE 10 (QTY = 1)			217(CF)
2			MS25281-R18		CLAMP, LOOP			218(BK)
2		56501	5715		PLUG, K O SEE NOTE 26			219(BY)
REF			645A865H13	V	WIREWAY, ELECTRICAL			220(BG)

NOTE

The LOW RF POWER maintenance–required lamp will light on the control panel fault display when the transmitter high voltage is turned on and the forward power sample cable is disconnected. Disregard the maintenance–required lamp during this procedure.

3. Temporarily disconnect detected forward power sample cable from crystal detector (CR4 for channel A, or CR5 for channel B). See figure 6-1 for location of crystal detectors CR4 and CR5.

NOTE

SMA coupling nuts should be torqued to 8 ± 1 inch–pounds.

4. Using SMA–to–BNC adapter, connect forward power sample from crystal detector to oscilloscope channel 1.
5. Set channel 1 input of oscilloscope to 50–ohm position.
6. Connect frequency counter to A1J4 (PRETO) of receiver A/B.
7. Adjust frequency counter as required to read average PRF.

6.3.1.2.3 Procedure. Proceed as follows:

1. Turn on transmitter high voltage and wait 10 minutes for transmitter to stabilize.
2. See figure 7-8. Measure and record 70 percent amplitude pulse width of detected forward pulse.
3. Observe and record average PRF indicated on frequency counter.
4. Using RMS average power reading, measured pulse width, and measured average PRF, calculate peak power with following formula:

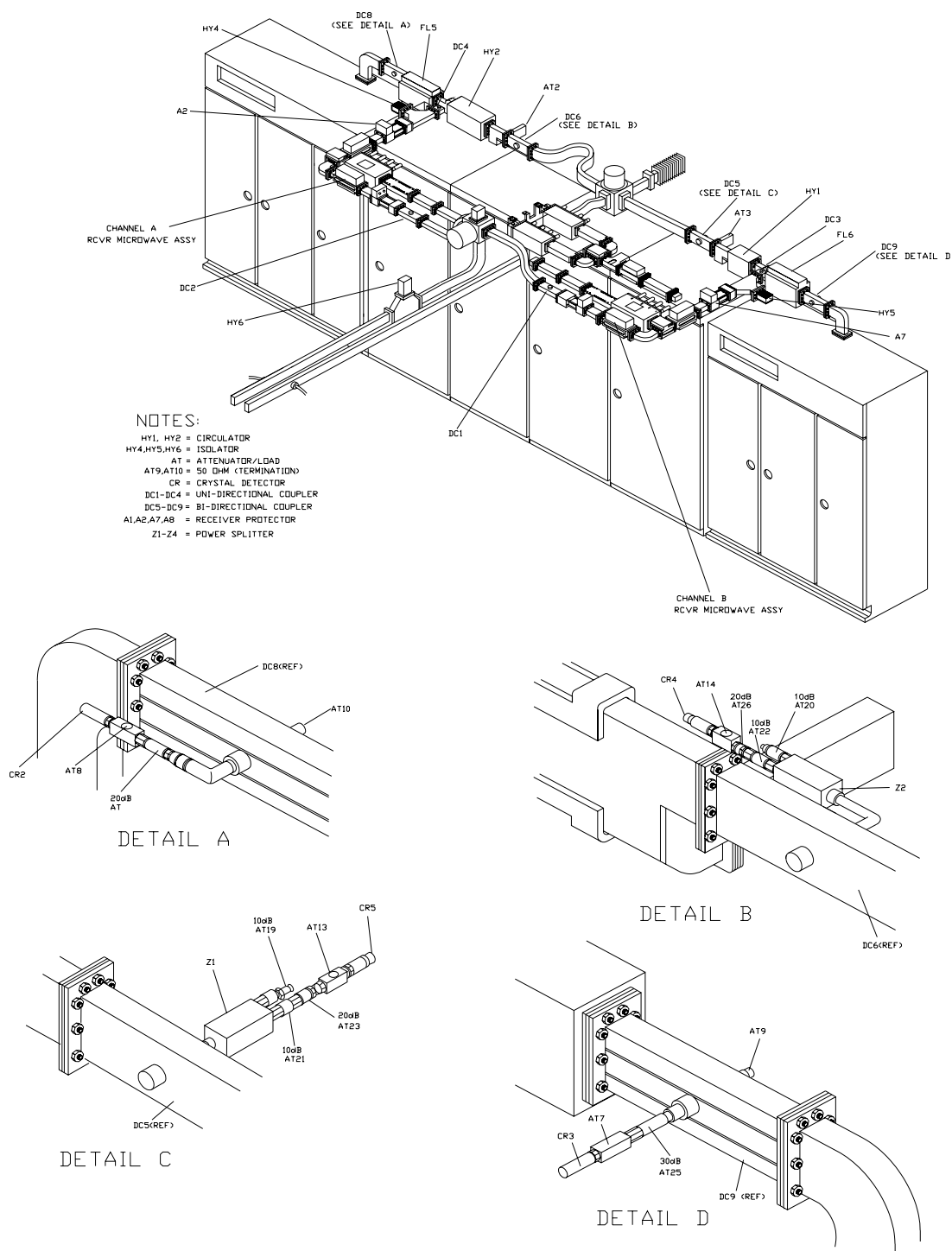
$$\text{Peakpower megawatts} = \frac{\text{average power watts}}{70\% \text{ pulse width mus} \times \text{average prf Hz}}$$

5. Verify that peak power is between 1.06 and 1.30 megawatts; refer to paragraph 7.8.5.6 to adjust peak output power, if necessary.
6. Turn off transmitter high voltage.

NOTE

SMA coupling nuts should be torqued to 8 ± 1 inch–pounds.

7. Remove all test equipment and restore transmitter to normal operation.



6565E-BJ-048H

FIGURE 6-1. OVERHEAD MICROWAVE COMPONENT LOCATIONS